Plaques Scores and Gingival Health Status between 5 To 20 Years Old Orphans and Parented Children

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Abstract: The study was conducted to assess plaque and gingival scores among orphans and parented children. This study was planned in an Orphanage school and a Private school. A total of 84 subjects were examined including 30 orphans and 54 school students. A modified Index of Loe and Silness was used to score condition of gingival levels. Similarly the plaque index developed by Silness and Loe used for the assessment of plaque levels. A periodontal probe was used for gingival index and a dental explorer for evaluating plaque scores. Chi-square test was applied to compare the values of plaque and gingival index at p value ≤ 0.05. More than half of the orphans (56.7%) and school children (55.6%) had mild type of gingivitis. The level of gingivitis was increasing with advancing age among orphanage children. The school children had worse plaque scores compared to orphans. The frequency of moderate plaque values enhanced with growing age in school going children. Orphans have a higher gingival index than children residing with their parents. Thus there should be adequate dental health educational programs for these children as well as for their parents or caregivers to improve the quality of oral health.

Keywords: Gingival Index; Plaque Index; Orphans; Children.

INTRODUCTION
An orphan is a child who has lost both parents or has been abandoned by them [1]. It is estimated that 153 million children worldwide, ranging from infants to teenagers have lost one or both parents [2]. Healthy personality development as well as full unfolding of opportunities is hampered in orphans by certain elements in their social environment such as lack of parental guidance, environmental deprivation and emotional disturbances [3]. Henceforth, they lack parental support and receive little general as well as oral health care [1]. Oral diseases seriously impair quality of life in a large number of individuals and they may affect various aspects of life, including function, appearance, interpersonal relationships and even career opportunities [1]. Oral diseases are significant health problems around the world [4]. Children from orphanages have shown a high prevalence of dental caries [5], gingivitis and dental trauma [6].

Gingivitis is an inflammatory process that begins in early childhood [7] and its prevalence is evident worldwide. Gingivitis is associated with dental bacterial plaque [DBP] and is the most common form of periodontal diseases [8] caused by the accumulation of dental plaque [9]. It has been shown that bacterial plaque found on the tooth surface is responsible for development of gingivitis, which is the initial stage of periodontal diseases [10]. Gingivitis is caused by various local and systemic factors. In general, localized tooth related factors contribute to the initiation and progression of periodontal diseases through an enhancement of plaque accumulation or the prevention of effective plaque removal by normal oral hygiene.
Common signs of gingivitis are redness and sponginess of the gingival tissue, bleeding on provocation, changes in contour and presence of calculus or plaque with no radiographic evidence of crestal bone loss [12]. Gingivitis is reversible condition with professional treatment and good oral home care, whereas periodontitis is irreversible one and may lead to bone destruction. Untreated gingivitis can lead to periodontitis. Hence if gingivitis is assessed at an early stage it will minimize the chance of tooth loss. According to World Health Organization, oral health is integral to general health and essential for well-being [13]. The present oral health survey [OHS] for children aged 5-20 years of age was conducted at an orphanage home and in a school setting. The survey focuses on gingival inflammation and accumulation of plaque.

MATERIALS AND METHODS

This comparative study was conducted at an Orphanage school (Yadvandra Puran BAL Niketan) and in a Private school in the city of Patiala. Informed consent was also obtained from the orphanage and school authorities and caretakers to carry out the study. Orphanage has population of 30 orphaned children and their age group ranges from 5 to 20 years. Around 54 students enrolled from private school with similar age group to assess the prevalence of gingival diseases.

A modified Index of Loe and Silness [14] was used to score condition of gingival levels. The index teeth to be examined were 16, 12, 24, 36, 32 and 44. On each tooth both facial (3 units) and lingual surfaces (1 unit) were examined. The scoring criteria values mentioned as: 0 (Normal gingiva), 1 (Mild inflammation), 2 (Moderate inflammation) and 3 (Severe inflammation). Similarly the plaque index described by Silness and Loe used for the assessment of plaque levels [15]. Index teeth are same as that of gingival index and the scoring criteria is 0 (No plaque), 1 (A film of plaque adhering to the free gingival margin and adjacent area of the tooth), 2 (Moderate accumulation of soft deposits) and 3 (Abundance of soft matter). The children were examined seated on a normal chair in the open room with natural light and the diagnostic instruments used were mouth mirrors, explorer and periodontal probe (Type III Examination). A periodontal probe was used for gingival index and a dental explorer was used to record the plaque score.

Data analysis
The data were analyzed using the SPSS version 15 software (SPSS Inc., Chicago, IL, USA). Chi-square test was applied to compare the values of plaque and gingival indices with variables and the level of significance was performed at p value ≤ 0.05.

RESULTS
Out of 84 subjects examined 56.7% of orphans and 55.6% of parented children had mild form of gingivitis as mentioned in Graph 1. Orphans in the age group of 11 to 15 and 16 to 20 had poor gingival conditions compared to the age group of 5 to 10 years (Table 1). Whereas school children aged 11 to 15 years were more effected with mild gingivitis than other age groups (Table 2).

Majority of the orphans (63.3%) and school children (87.0%) had mild plaque scores and very few had moderate amount of deposited plaque as shown in Graph 2. Age wise, older orphan groups (11 to 15 and 16 to 20) had more plaque accumulation than younger ones and the presence of moderate plaque scores was only seen in the age group of 16 to 20 years (Table 3). School children aged 11 to 15 years had higher mild plaque scores (55.6%) and the frequency of moderate plaque values increased with advancing age (Table 4).

Graph 1: Gingival index scores of Orphans and School Children

Available online at http://sasppublisher.com/sjams/
Table 1: Gingival index scores of Orphans according to age groups

<table>
<thead>
<tr>
<th>Age</th>
<th>Normal</th>
<th>Mild</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 to 10 years</td>
<td>2(6.7%)</td>
<td>1(3.3%)</td>
<td>0.673</td>
</tr>
<tr>
<td>11 to 15 years</td>
<td>6(20.0%)</td>
<td>8(26.7%)</td>
<td></td>
</tr>
<tr>
<td>16 to 20 years</td>
<td>5(16.7%)</td>
<td>8(26.7%)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>13(43.3%)</td>
<td>17(56.7%)</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Gingival index scores of School Children according to age groups

<table>
<thead>
<tr>
<th>Age</th>
<th>Normal</th>
<th>Mild</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 to 10 years</td>
<td>7(13.0%)</td>
<td>5(9.3%)</td>
<td>0.456</td>
</tr>
<tr>
<td>11 to 15 years</td>
<td>13(24.1%)</td>
<td>21(38.9%)</td>
<td></td>
</tr>
<tr>
<td>16 to 20 years</td>
<td>4(7.4%)</td>
<td>4(7.4%)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>24(44.4%)</td>
<td>30(55.6%)</td>
<td></td>
</tr>
</tbody>
</table>

Table 3: Plaque index scores of Orphans according to age groups

<table>
<thead>
<tr>
<th>Age</th>
<th>Normal</th>
<th>Mild</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 to 10 years</td>
<td>2(6.7%)</td>
<td>1(3.3%)</td>
<td>0.518</td>
</tr>
<tr>
<td>11 to 15 years</td>
<td>5(16.7%)</td>
<td>9(30.0%)</td>
<td></td>
</tr>
<tr>
<td>16 to 20 years</td>
<td>3(10.0%)</td>
<td>9(30.0%)</td>
<td>1(3.3%)</td>
</tr>
<tr>
<td>Total</td>
<td>10(33.3%)</td>
<td>19(63.3%)</td>
<td></td>
</tr>
</tbody>
</table>

Table 4: Plaque index scores of School Children according to age groups

<table>
<thead>
<tr>
<th>Age</th>
<th>Normal</th>
<th>Mild</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 to 10 years</td>
<td>0(.0%)</td>
<td>12(22.2%)</td>
<td>0(.0%)</td>
</tr>
<tr>
<td>11 to 15 years</td>
<td>3(5.6%)</td>
<td>30(55.6%)</td>
<td>1(1.9%)</td>
</tr>
<tr>
<td>16 to 20 years</td>
<td>1(1.9%)</td>
<td>5(9.3%)</td>
<td>2(3.7%)</td>
</tr>
<tr>
<td>Total</td>
<td>4(7.4%)</td>
<td>47(87.0%)</td>
<td>3(5.6%)</td>
</tr>
</tbody>
</table>

DISCUSSION

Maintenance of oral hygiene is known to be an integral component of oral health of an individual. A majority of oral diseases are found in disadvantaged and socially marginalized population. Thus, orphanage children are such disadvantaged groups having limited accessibility to oral healthcare. This is due to lack of sufficient financial resources and adequate dental manpower. This study showed the prevalence of gingivitis among orphans as >56.7% which was slightly higher when compared to school going children (55.6%), this can be due to lack of regular dental check-up in orphanage community. However, the plaque scores in school children (87.0%) was higher than orphanage children (63.3%), this could be due to more
consumption of carbohydrate diet among school children.

The prevalence of gingivitis in children residing in an orphanage home showed that 11-20 years (>53.4%) of children with mild to moderate gingivitis. Whereas Shanbhog et al.; [16] evaluated 488 children between 12-14 years old living in different orphanages and showed 36.1% of them with mild form and 27.9% with moderate form of gingivitis.

In the present study, the prevalence of gingivitis among school children was 55.6% whereas 84.3% prevalence was seen in the reports of Dhar et al.; [17] which were very higher when compared to our findings. The results of this survey showed that 38.9% of school going children aged 11-15 years had gingivitis of mild to moderate severity, it was less when compared it with recent survey in Lucknow among school going children aged 8-16, showed 71.1% prevalence of gingivitis [18]. In a Metropolitan region [19], Palma (2007) reported a prevalence of mild gingivitis in 60% and moderate gingivitis in 40% school children. In Danube Delta Biosphere Reserve [20], gingival bleeding was found to be in 32.8% in school going children aged 6-12 years. The reasons of increasing gingival inflammation as age advances might be due to improper and unsupervised tooth brushing. Moreover mixed dentition and malocclusion contributes as an additional factor for the accumulation of plaque resulting in gingivitis [21]. Hugoson et al.; also found that in children with 10 years of age, gingivitis was significantly correlated with the eruption pattern of teeth [20].

Todd and Dodd (1985) found that the prevalence of gingivitis increased with age [22], also due to hormonal changes at the puberty enhances the inflammation gingival tissue [23, 24]. In a study conducted among Jordanian school children, it was reported that 14-15 years old had higher GI when compared with the >6 year old group [25]. In the present study, plaque scores was in 87.0% for school going children which is in agreement with the study conducted among children of Hyderabad division. The current data showed the higher levels of plaque were in agreement with others studies [17, 20], this variation in score may be due to difference in oral hygiene practices, culture and diet pattern.

CONCLUSION
This study revealed that orphanage children had a higher gingival index than parented children. Also, the presence of plaque was higher in both the groups because of a neglected oral hygiene. Thus, there should be increased exposure to dental health educational programs for these children as well as for their parents or caregivers to improve the quality of oral health.

REFERENCES


